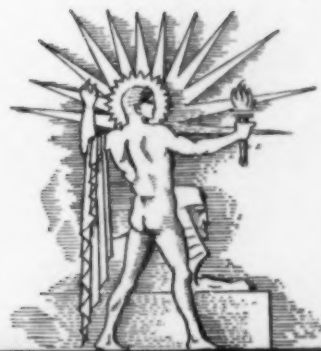


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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



OCTOBER 17, 1931

The She-Wolf Guards Her Young

See Page 248

A

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VOL. XX

No. 549

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Summary ofCurrent
Science

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DO YOU KNOW THAT

There are about 2,000 blends of tea.

A rivetless ferryboat, constructed entirely by welding, has been completed.

Alligators are allies of fishermen in that they eat turtles and gars, two deadly enemies of game fish.

Fish lie with their heads towards the current, and therefore fishing upstream is apt to be most effective.

When a pet rat clicks its teeth it is showing contentment, like a purring cat, according to two scientists of the Wistar Institute.

A hobby fair, where those who ride hobbies of collecting or sketching or photographing can exhibit their trophies, is being held by the Buffalo Society of Natural Sciences.

Because so many California fish are known by several names, and because the same names are applied to different fish, state officials have published a booklet which housewives may carry to market for use in identifying the kind of fish they want.

A mixture of carbon black and crude oil spread thinly on the surface of ice hastens spring thawing and permits the earlier passage of boats.

Early examples of veneered furniture can be traced back to ancient Egypt, when it was made for kings.

London physicians are expecting to be kept busy with measles cases this winter, as the disease breaks out in the city every alternate year.

How rapidly cornerstone records deteriorate if not safeguarded was shown recently when a theater in Washington was razed and the records, stored only 47 years, were mostly undecipherable.

A new law compels farmers in Spain to keep all farm units in productive operation, in order to reduce agricultural unemployment and to lessen import requirements.

The oldest known attempt at keeping weather records in this country was made in 1644 by a minister in New Sweden, near the present city of Wilmington, Delaware.

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Science Service presents over the radio, an address

IDENTICAL TWINS

By Dr. H. H. Newman, Professor of Zoology at the University of Chicago and Prominent Embryologist

Friday, October 23, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

MEDICINE

Latin America Menaced by Disease Causing Blindness

Tropical Malady Due to Parasitic Roundworm Transmitted By Widely-Distributed Group of Blood-Sucking Insects

THE TROPICAL DISEASE, coastal trypsin, which causes blindness, can become a Pan-American problem like malaria and yellow fever, in the opinion of Dr. Alfons Dampf, chief entomologist of the Mexican Government, who reported his investigations on the subject in the Chiapas region of southern Mexico to the Pan-American Medical Association.

Spreading from Interior

The disease is caused by a parasite which spends part of its life in blood-sucking insects like buffalo gnats or black flies. Dr. Dampf made a special study of these bloodsucking insects and found that one of them is distributed from Trinidad, West Indies, to northern Mexico and another of them from British Honduras to the state of Vera Cruz and from Guatemala to the state of Oaxaca. As the disease in Mexico is slowly spreading from the interior to the coast, and as the transmitting insects are present in a much greater area, the conclusion is inevitable that onchocercosis, as the disease is known scientifically, can become distributed over the greater part of Central America, invading perhaps also South America.

The parasite which causes the trou-

ble is a nematode or roundworm of the *Filaria* family, from one to twenty inches long. It lives coiled up in tumor-like swellings under the skin of human beings. The larvae of this worm, in the form of the so-called microfilaria, swarm up from the cysts or swellings to invade the peripheric lymphatic ducts and are there picked up by bloodsucking insects of the Simuliid family (buffalo gnats or black flies). The larvae undergo a transformation in the gnats, after which, the next time the gnat sucks blood, the mature microfilaria are passed from the proboscis of the fly or gnat to another person, Dr. Dampf explained.

As a result of the joint efforts of the commission of the Harvard Medical School under Prof. Richard P. Strong, working in Guatemala, and of the various commissions of the Mexican Public Health Department, of which Dr. Rafael Silva is chief, which studied conditions in Chiapas and Oaxaca, the clinical aspects of the disease and the biology of the transmitting insects were learned. These investigations also showed that the vision of man is affected by actual invasion of the eye by the microfilaria. What species of Simuliids and how many were concerned in the spread of the disease had still to be

shown. Dr. Dampf's study supplies this necessary information.

In view of the danger of spread of the disease, the Mexican Government, through the Public Health Department, has begun an active campaign against the Simuliids, the transmitting insects, in Chiapas. The people are being forced to clean the breeding places in the mountain brooks and rivulets, to avoid in this way the imposition of the flies on the submerged vegetation. A special Onchocercosis Commission, under the leadership of Dr. S. Gonzalez Herrejon, sent a staff of medical officers to the infested places, with the order to operate on every person having tumors and in this way to eliminate the danger of infection.

According to Dr. Dampf's report, the parasite was probably brought from Africa with Negro slaves who escaped their masters and found a refuge in the interior of Guatemala, where transmitting Simuliids are plentiful. In the same way two other disease-producing parasites, *Filaria loa* and *Dracunculus medinensis*, were once brought from Africa to South America.

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ETHNOLOGY

White Men Copy Indians Who First Copied Them

NAVAJO Indians, famed for their dyed-in-the-wool conservatism, are taking to new ideas in house building. Navajo hogans with glass windows and stovepipes may be seen along roads in the Navajo reserve in New Mexico and Arizona. Other hogans are made of stone and discarded railroad ties—a ven-



NEPTUNE'S BODYGUARD

Plesiosaurs or giant long-necked sea-lizards and fish-lizards—creatures which were terrors of the seas one hundred and twenty million years ago, as restored in a large mural painting recently presented to Field Museum of Natural History by Ernest R. Graham. Charles R. Knight is the artist.

ture in "lifetime homes" which is something new to these Indians.

These innovations have been adopted only by more progressive members of the tribe.

For centuries the Navajos have seen in their wanderings the stone dwellings inhabited by Pueblo Indians. But fixed abodes of stone were not for the Navajos. They preferred their wood and mud hogans and the light, easily constructed summer shelters ingeniously made of interlaced juniper trees.

The late interest of the Navajos in better homes has had a strange boomerang effect upon white residents of the region. White men have begun to construct houses like these new-fangled

Navajo hogans. The style of architecture is peculiar. The modernized hogans are round stone structures with adobe roofs, resembling somewhat the round domed concrete "pill boxes" used in the World War.

Whether this form of architecture will take hold upon the greater portion of the Navajo tribe remains to be seen. Perhaps as long as the vast spaces of Navajo land remain unfenced, and the great herds of sheep and goats wander in gray-brown floods over the pastures, the old type log and mud hogan will serve to house many Navajos in the fashion that was good enough for their ancestors.

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ENGINEERING

Magnesium Cement Developed Having Hardness of Granite

THE EXPRESSION "as hard as rock" will have to be changed to "as hard as cement" if the experiments of Dr. Howard S. Lukens, of the University of Pennsylvania Chemistry Department, work out as he has reason to think they will. For six years Dr. Lukens has been working with a combination of magnesium oxide and magnesium chloride, and he now has a cement which has the tensile strength of 2000 pounds per square inch. It is as hard as granite.

The catch is that the cement so far can be used successfully only for interiors, for water does something to it and it disintegrates. However, it is now possible to fabricate a stable magnesium cement product which does not absorb moisture from the air, and that is something ordinary Portland cement has never overcome.

Dr. Lukens has made some pieces of magnesium cement which have been lying in his laboratory for three years, and have not even been warped by the air. They are in perfect condition, and are excellent, Dr. Lukens said, for inside walls and floors.

"This cement," Dr. Lukens stated, "is of an extraordinary hardness and tensile strength. It sets quickly. It can be used with many aggregates to make other products. It is excellent for insulating wall plaster. Gypsum plaster, for instance, has no strength. The magnesium cement is very strong and very durable. It needs only one coat from

one-quarter to three-eighths of an inch thick, while in ordinary wall plastering three-quarters of an inch is necessary. With the magnesium product less labor and less material are needed to give a harder, denser coat."

Dr. Lukens made the cement by mixing magnesium oxide and magnesium chloride in water.

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SOCIOLOGY

Huxley Says Birth Control Threatens World Depopulation

THE DANGER of depopulation during the next hundred years stares in the face even those countries where overpopulation has been considered a threat, due to deliberate prevention of conception by large sections of the population, Prof. Julian S. Huxley, biologist of King's College, London, predicted to the British Association for the Advancement of Science.

"We face the problem of regulating the quantity of human members and preventing under or overpopulation," he said.

Deliberate birth control is the largest factor in limiting population. It is unique to human species. But post-

PSYCHOLOGY

Laborers Can be Taught To Make Most of Energy

INDUSTRIAL workers, interested only in how much they can produce, and resting or keeping to their tasks as their feelings alone dictate, may be the rule in the factories of tomorrow. Tests made at Purdue University, under the direction of Profs. George H. Shepard and George Brandenburg, have shown that workers can easily be taught to make the most of their energy.

Ordinary laborers, trying to give a maximum output at piece work or under similar stimulus, will resist fatigue until the resulting sensations become severe, the investigation concluded. As this tendency is exactly wrong, the workers must be taught to rest for a time at the first feeling of fatigue, a course followed by workers of superior physique and intelligence without being trained to do so. After following a special task routine, however, the usual worker can rely on his sensations as a basis of efficient choice for work and rest periods.

Students at Purdue University, a report to the Society of Industrial Engineers states, were used in the tests. The workers, all physically fit, went through gymnasium routine, resting at intervals to have their weight, pulse and other measurements of fatigue recorded.

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ponement of marriage and many remaining permanently unmarried, also contribute to the situation, Prof. Huxley declared. Differential fertility of individuals, classes and nations demands urgent study, with the objective of improving the average quality of the human population.

Prof. Lancelot Hogben reinforced Prof. Huxley. If birth control continues, he said, it will be "difficult to foretell what extensive change in family economics and social organization will be requisite to create new incentives to parenthood to insure against gradual extinction."

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ARCHAEOLOGY

Mystery of Prehistoric Clay Figures is Believed Solved

French Physician Shows that All Figurines he Gathered In Mexico Represent People in Distress of Mind or Body

A FRENCH PHYSICIAN may have the right answer to the riddle of at least some of the small, "unexplained," prehistoric clay figures of people—persistent puzzles to archaeologists—which are found almost everywhere in Mexico.

The figurines are only a few inches high. Most of them are crudely made, but are extremely clever. Although of pre-Columbian manufacture, they are still very plentiful in most fields and archaeological sites.

What were they used for?

Dr. E. Berillon suggests an answer, at least for many figures which he has gathered from all parts of Mexico. All his little human figures represent people in distress of mind or body. There is a woman whose body is covered with eruptions, a man in agony from toothache, another with colic in his liver. Still another is insane, tied up in a

"straitjacket." Such figurines, Dr. Berillon thinks, were thank-offerings to the gods for curing ailments of body and soul, or petitions to them to work such cures. All of them are pierced with holes, and may have hung upon some ancient altar or idol.

Dr. Berillon has studied large numbers of these little clay figures that seem to portray suffering, and he thinks the art is so directly to the point that he can tell what was wrong with the victim. The obvious eruptions on the woman's body, he believes, may represent ordinary pimples, or they may be syphilitic sores—if, as many doctors believe, that disease is of American origin.

One of the most interesting figures is that which he believes represents an insane person. This figurine is tied up, in a prehistoric straitjacket. The mouth is open and the tongue is out, and on the figurine's back is a lizard

gnawing at his brain. Mental diseases, Dr. Berillon says, were believed by the ancient Aztecs to have been caused by lizards. If his interpretation of the figure is true, then the Aztecs knew that the mind centered in the head.

While the actual use of these ancient images and idols cannot be conclusively proven, they are found by thousands from Mexico to northern South America. Of course, not all of them are "pathological" like those studied by Dr. Berillon. Sometimes the figures are found in graves, and appear to have been portraits or caricatures of the departed. Female figures are plentiful in fields, and archaeologists think they might have been clay prayers for taller corn, better beans, or hotter chile peppers, since the female figure is said to have represented productiveness.

Modern Customs Similar

These are only guesses of archaeologists. But in view of Dr. Berillon's suggestion, it is interesting to note customs in Mexico today. Everywhere the Mexican Indian gives modern "ex votos" to the Christian God or to the saints. In almost any Indian town in Mexico the Virgin or patron saint of the local church, whoever it may be, has his mantle or robe covered with an astonishing number of little silver arms, legs, eyes, heads, hearts, noses, or other parts of the human body. Figurines of the whole body are common also. These are gratitude offerings of the already cured, or petitions of those still suffering.

The Indian prays not only for the welfare of his own body, but for his farm animals and pets. He also prays for his crops and fields, and for rain in drought. If his burro is incapacitated with a sore back, a little silver burro goes upon the hem of the Virgin's robe in the morning. Or just before the new brood of turkeys is hatched, the Indian may pin a silver turkey upon the heart of San Lorenzo or of San Francisco or the Virgin of Guadalupe or of Soledad, so that they will not forget what is expected of them. Images of saints are known to have been stood upside down in a corner when they failed to grant some reasonable request. The robes of the Virgin are sometimes pathological museums in silver, or mingled botanical and zoological gardens. One saint's statue in Cordoba, in the State of Vera Cruz, had on its mantle, among other silver offerings, a bull, a corn ear, a cat and a turkey.

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THANKSGIVING OR APPEAL?

One or the other, it is believed, was the object of modeling such clay figures which are only a few inches high. The above sketch shows the figure on the left to be suffering, supposedly, from toothache. The other figure seems to have the colic.

ENGINEERING

Setting the World to Streamlines

**Automobiles, Aircraft, Rail Trains and Water Vessels
Make Greater Speed on Less Power through Proper Design**

By CAROL NEWMAN, JR.

SUPPOSE you are speeding along the highway in your present-day automobile of conventional body design at 60 miles an hour.

Then imagine that a sudden transformation comes over your car. Its engine is moved to the rear. The flat radiator is rounded off and the headlights and fenders sink into a smooth bulging front. The squared-off rear is drawn out in a long, sharp taper.

Now look at your speedometer. Instead of going sixty, you are making seventy-five miles per hour and you haven't shoved the accelerator down a fraction of an inch farther. Your speed has increased from sixty to seventy-five miles per hour without an increase in gasoline consumption. Road tests show that even imperfect streamlining will bring about such an increase in speed.

This imaginary transformation typifies one of the chief results of streamlining. And it is a vision that gives promise of fast becoming a reality.

Streamlining will have other effects on your car.

If it is streamlined properly you will soon find that you are driving 35 to 40 miles on every gallon of gas, or at least twice what your mileage is with the old shape. Walter T. Fishleigh, consulting engineer of Detroit, vouches for the accuracy of this statement. He also deplores the old fashions in automobile designs. He sees a ridiculous likeness in general form between the modern auto with its engine in front and the horse-drawn milk wagon of twenty years ago.

Tests have actually proved that the present automobile, with its square back and numerous projections, is built to be held back by air about as much as a moving body could be.

Quite a stir has been created recently over the possibilities of the "tear-drop" car, it being popularly believed that a falling tear or drop of rain takes the form of the perfectly streamlined body. Dr. H. L. Dryden, aerodynamics expert of the U. S. Bureau of Standards, intimates that too much faith is placed

in the infallibility of the tear-drop form.

"As a matter of fact," he says, "any body shaped without the steep curvatures which cause wind eddies is really streamlined. The 'tear-drop' form is not, from a standpoint of streamlines, necessarily the best."

Dr. Dryden cautioned that a superficial streamlining, such as smoothing off of square edges, will not bring results. Automobiles, he said, must be remodeled according to definite principles formulated from actual tests.

Fixed by Air Resistance

He also said few motorists realized that the maximum speed of the ordinary car is definitely fixed by air resistance. At speeds of over 40 or 50 miles per hour the resistance of the wind forms practically the only obstacle to overcome, and thus a lowering of this resistance would mean a corresponding increase in speed. This fact is little short of astounding when one remembers that with streamlining it is possible to cut this resistance in half.

Equally illuminating is Dr. Dryden's statement that the so-called streamlined body which will produce double mileage on a gallon of gas, actually encounters ten times the resistance of the perfectly streamlined body. This difference leaves a superlative goal for the future, which if only approached might mean riding a 100 miles or more on a gallon of gas!

Streamlining in automobiles involves a number of radical changes, beside that of the shape alone. It means placing the engine to the rear of the passengers, swinging the seats low between the axles, and reducing the cross-sectional area of the car body. Streamlining is calculated to make driving easier and more economical because of a simpler construction of automobile parts. Dust clouds will be absent behind the moving car as a result of the smooth air currents.

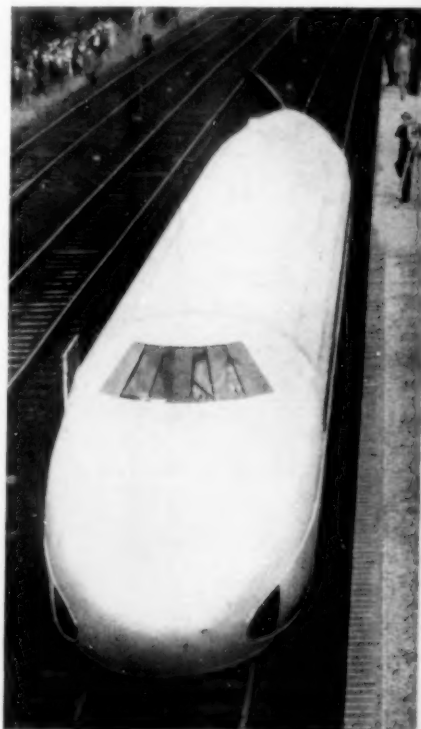
Already trucks on at least six freight lines in California have been able to carry cargo up to the legal weight limit with little increase in gasoline consump-

tion. This was possible by making the front ends of the trucks smaller, which cut down the air resistance. Drivers found they could tell which direction the wind was blowing by simply checking the amount of gasoline used.

Automobiles with streamline features are not uncommon along the highways of Germany. In England, also, streamlined cars are beginning to be seen. Not long ago the first examples of Sir Denistoun Burney's "airship model" automobile made its appearance on English roads. Crowds of people were astonished at the gracefully curved machine with its one-piece body and engine in rear. Though the car develops but 22 horsepower actual highway tests show it can attain a speed of 80 miles per hour. In other countries as well streamlining is being looked to hopefully.

But automobiles are only a part of the streamline story.

There is hope for cutting the annual coal bills of all express trains in France by one-third through the application of



RAIL ZEPPELIN

Streamlined to look like a huge fish and driven along by a propeller at the rear, this German creation recently set a speed record of 143 miles per hour.

streamlining. Experiments performed by M. Charles Maurain, of the Aeronautics Institute of Saint Cyr, have led to the conclusion that air resistance forms at least a third of the total resistance encountered by a train, and consequently properly styled cars would mean a saving on French systems of well over a million tons of coal yearly.

Hidden Smokestacks

Several trains on the continent have already been streamlined to a certain extent. One in northern France, the "Golden Arrow," presents a curious appearance, with its coaches tight end to end and a shining aluminum cone projecting at the rear. Even in the United States engines with hidden smokestacks, built-in headlights and smoothed-off corners can be seen.

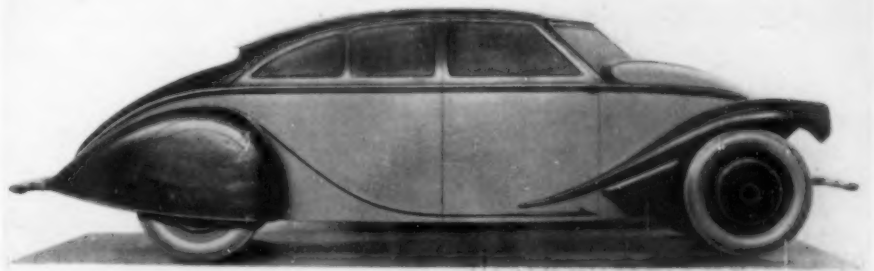
Tests are being conducted with models in the Westinghouse Research Laboratories to determine the effects of streamlining as applied to high-speed express and interurban trains. Chief among the investigators there is Dr. O. G. Tietjans, whose experiments have prompted his belief that streamlining for express trains will reduce wind resistance by two-thirds and the total train resistance to one-half.

While streamlining is less important to heavy trains at low speeds, Dr. Tietjans found that if the proper design were given the present light interurban train, the total horsepower required to drive it at a speed of 75 to 80 miles per hour could be reduced by more than half.

Styles of revolutionary character for high-speed trains are expected to be worked out as a consequence of these tests, making the trains notable for their efficiency and economy of operation. The application of streamlining to railways may not be as extensive as in the case of airplanes, but the work already done and the fact that a group of the foremost French railway technicians are convinced of the practicability of streamlining constitute some indication of its future in the railway field.

Back about 1910, when man first began exploring the sky, streamlining got its first real trial outside of nature. Here resistance was all of an aerodynamic sort, and it was soon found that the original box-shaped airplanes wouldn't do.

Just as an example of what skilled design means in the air, Dr. Joseph S. Ames, chairman of the National Advisory Committee for Aeronautics, has said that sufficient streamlining will



THE "TEAR DROP" CAR

Showing the trend in design which automobiles of the near future may follow.

reduce the resistance of an airplane by two-thirds. Thus any of the giant trimotored ships which fly the passenger lanes of the country could, if correctly designed, leave off two of their engines and still develop as much speed as they do with all three at the present time!

And the streamline features of the engine hood developed by the National Advisory Committee have increased the speed of the ordinary commercial plane by at least twenty miles per hour, Dr. Ames said.

That airplane designers are cognizant of the importance of streamlining today is shown by the display recently of the British Royal Air Force. New styles calculated to lower wind resistance were illustrated by planes developed in the constant search for more perfect streamlining.

There is still room for much development in streamlining in aviation. Devices such as landing gear and projections about the cockpit increase air resistance 50 per cent. or more and must be done away with or built in, if much higher speeds are to be obtained without some radical innovations in motors.

Projections make such a big difference because a streamlined body is delicately balanced and must head straight into air currents if it is to find the easiest path. Fins on airplanes and racing cars are for the purpose of helping the car or plane maintain this head-on position.

On sea, as on land and in air, streamlining is beginning to make rapid strides. The most important single factor that has enabled power boats to attain speeds of nearly a hundred miles per hour is the changed design of the hull. The old V-shaped vessels that displaced so much water have given way to the flattened-out hydroplane design with the "stepped" bottom, which has

tripled the possible speeds of motor boats.

Partial streamlining has been applied successfully to some of the big ocean liners. The "Bremen," which holds the speed record for crossing the Atlantic, presents a striking picture with its oblong stem, cylindrical stacks, and block-shaped bridges.

Among the boats of recent design are those driven by airplane propellers, which may soon speed along all the inland waterways of Germany. They evince more consideration for the air resistance, which is almost as important as the water factor. Bodies that engineers streamline for use in the air have been found to be efficiently streamlined for water operation at low speeds. At high speeds, however, the conditions of resistance vary greatly. A boat moving through the water at 100 miles per hour is having the same resistance troubles that an airplane would face rushing along at 1300 miles!

Streamlined Skyscrapers

But the reach of streamlining doesn't end with objects which move fast. Wind pressures have been studied with the view to streamlining office buildings so they can hold their own against the gales which worry skyscraper tops. Deep in the earth, air passages in coal mines are being streamlined because of the saving in power required to pump the air through them. So the story goes.

The first theories concerning streamlining held that all bodies were streamlined regardless of shape. But after the first tests, this idea was hastily abandoned. Experiments recently made at Langley Field, Va., have shown that a body which is from four to six times greater in length than in diameter is most nearly streamlined. As speeds increase streamlining is found to make a bigger difference. (Please Turn to Page 253)

PHYSIOLOGY

Effects of Electric Shock On Rats are Determined

IF A 1000-volt electric current passes through the body of a rat between his front leg and his tail, he has almost an even chance to recover. But if the path of the current is from front leg to hind leg, he is pretty sure to succumb. This difference in effect was discovered by W. B. Kouwenhoven and O. R. Langworthy of the Johns Hopkins University. It is explained by them, in a report to the American Institute of Electrical Engineers, on the ground that a current flowing from front leg to hind leg finds less bodily resistance than in the other case, and, as a result, becomes high enough to cause death.

In the course of the experiments the conclusion was reached that a continuous current is much more dangerous to rats than an alternating one of the same voltage. Burning of tissues was reported as being more severe when produced by a continuous current.

Points of electrical contact on the rats were varied purposely. A current passing from one fore leg to the other was found to be fatal in every case, while a current from hind leg to hind leg produced only temporary disability. It was also discovered that injury caused by the current going from left fore leg to tail was less severe than that caused by the same current flowing from right fore leg to tail.

According to experimenters, the conclusion made by another investigator that an electric current passing through the brain stops the breathing process for a time, was confirmed. It was also found that the brain cells can be fatally injured by an electric current. When vital organs were not in the current's path the effects were not serious.

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ENTOMOLOGY

Maternal Cares Multiply With Coming of Cold

See Front Cover

WINTER has breathed a hint of its coming already, in puffs of frosty air that make us forget the heats of summer that is gone, even of the unseasonable hot spell of early September. But the coming of the cold bodes only ill for the cold-blooded creatures of field and forest. They have but two alternatives: to die, leaving eggs, larvae

or pupae in safe places to carry on the life of the species next year; or to endure the cold and drought in the death-like slumber of hibernation.

Spiders take both courses. Some species leave their egg-balls hidden in crevices or suspended in webs, and crawl away to die. Others drag their eggs-balls with them and hibernate, mother and unhatched young sharing the same hiding places. Thus one will see, every autumn, spiders dragging their thousand-fold cradles with them.

The particular specimen shown on the cover, is a close-up of one of the fiercest and most formidable of the hunting spiders, a member of the large genus *Lycosa*, better known as the wolf spiders. This one was photographed in an attitude of jealous maternal watchfulness by Cornelia Clarke.

Science News Letter, October 17, 1931

ETHNOLOGY

Prehistoric Americans Had Well-Balanced Diet

PREHISTORIC MAN in southwestern Colorado had a fairly well-balanced diet, is the conclusion of Dr. Dwight W. Rife, official physician at Mesa Verde National Park during the past season.

Dr. Rife has arrived at this conclusion after studying the kitchen middens and refuse heaps of the early cliff dwellers, their food caches, and existing plants and animals of the region.

The typical Indian cliff dweller was a sedentary agriculturist and occasional hunter and had yellow corn for his main article of diet. Recent studies of yellow corn, Dr. Rife states, show that it contains, in addition to necessary food elements, the important vitamin A in abundance.

The Indians also ate the fruit of the yucca, and possibly a paste made of its seeds. They ate berries, seeds of certain grasses which when dried and ground made a mealy paste for their primitive hot cakes, beans in large quantities, squashes and edible gourds. They harvested pinon nuts to eat through the winter, and also the roots and shoots of various plants, such as the bulbs of the sago or Mariposa lily.

Wild game these early Indians had in abundance. Venison, mountain sheep, rabbits, and perhaps game birds fell to the hunter's arrow.

Primitive man needed salt for seasoning, as we do today.

Science News Letter, October 17, 1931

IN SCIENCE

VITAL STATISTICS

Accidents Leading Cause Of Death Among Children

ACCIDENTS, tuberculosis, heart diseases, pneumonia, diphtheria and appendicitis are the six most important causes of death among school children between the ages of five and nineteen years, Selwyn D. Collins of the U. S. Public Health Service has just reported as the result of a special study of mortality records of the U. S. Census Bureau.

"Accident is easily the leading cause of death, and automobile accidents constitute about one-third of the total accidental deaths," his report on the mortality of school children stated.

The death rate for girls between the ages of five and nineteen was less than for boys of the same age group.

An encouraging decrease was found in deaths from all causes at these ages from 1900 to 1927.

"Considering all causes of death, the age group ten to fourteen has the lowest mortality not only for the school ages but for any age throughout life," Mr. Collins reported.

Science News Letter, October 17, 1931

CHEMISTRY

Heat Waves Show Water Molecules Form in Clumps

NEW EVIDENCE that liquid water molecules form in clumps of two or more has been presented by Prof. Joseph W. Ellis of the University of California at Los Angeles.

The new evidence comes from the way in which infrared or heat rays are absorbed by water. Certain new bands or dark patches observed in the infrared spectrum favor the theory that the simple chemical units of two hydrogen and one oxygen atoms are probably linked in groups or even form a lattice-like structure.

This theory has not been in favor with chemists recently. However, some phenomena observed during the formation of ice lend considerable weight to the idea.

Science News Letter, October 17, 1931

SCIENCE FIELDS

PHYSICS

Best Vacuum Known Only Relatively Air Free

HOW BADLY does nature abhor a vacuum? Scientists of the Bell Telephone Laboratories have recently perfected a method of measuring the best vacuum known to science and thus answered this question.

Dr. Edwin K. Jaycox and Dr. H. W. Weinhart, using an ionization manometer of new design, have found that when they have pumped out the last remaining traces of air from a vessel there are still left some 500 million molecules in every cubic inch. This seems a lot but it is, in fact, only one three-trillionth of the original amount of air.

The attainment and measurement of the best vacuum has become increasingly important now that photoelectric and other vacuum cells have become of such importance in industry. The emission of electrons from a metal surface, on which these devices depend, is very much hindered by the presence of even the smallest amounts of gas.

The ionization manometer used in this work is similar in construction to the familiar kenotron or radio tube. Electrons are produced by a hot filament and pulled towards a plate by a positive voltage. On the way towards the plate they strike any gas particles that happen to be in the way and give them a positive charge. The positive ions thus formed are drawn off by another electrode and used to measure the extent of the vacuum.

Science News Letter, October 17, 1931

ENGINEERING

Motor Car Requires Best In Practical Illumination

THE MOTOR CAR is a creation of light. Not that blazing lamps or the sun's rays will alone turn out a sport model, but as few people realize, automobile production requires the ultimate in practical illumination.

All the way from the foundry to the point of finished bodies, light of particular intensity and character plays a vital part. In one of the principal auto man-

ufacturing companies of Detroit, a report in the *Electrical World* tells, light intensities varying from 8 to 140 foot-candles are employed. Lights of 20 foot-candle power are used most on the average.

Normal daylight, because of its variability, is not sufficient. To supplement it, about 3,000 mercury-vapor lamps lend their light in the manufacturing company surveyed, and 25,000 ordinary incandescent lamps. Both types together illuminate the entire area of the plant, three million and a quarter square feet. Even the finished product demands plenty of light, as a nocturnal inspection of any fashionable display room will prove.

Science News Letter, October 17, 1931

PUBLIC HEALTH

Pupils Absent from School Thirteen Days Annually

THE American school child is absent on the average of 13 days per school year and more than half of these days lost are due to sickness, a survey just completed by the U. S. Public Health Service shows.

The survey was made among school children in Hagerstown, Md., in some towns in Missouri, and in Pinellas and Orange Counties, Fla. It is believed that the data collected from these localities fairly represent the extent and character of the illness and physical defects that are commonly found in school groups.

The six diseases causing the most cases of illness among these school children were, in order of importance, colds, headaches, digestive disorders, tonsillitis and sore throat, toothache, and influenza and grippe. The six that were most important in terms of days lost per child per school year were colds, influenza and grippe, tonsillitis and sore throat, measles, mumps and digestive disorders.

Girls were sick oftener and lost more days per year than boys.

Another fact brought out in the survey was that three-fourths of the children examined in a group of localities had one or more physical defects other than defective teeth, vision or hearing. The defects most frequently noted in physical examinations were decayed teeth, defective vision, defective tonsils, enlarged glands in the neck, excessive wax in ears and thyroid gland enlarged.

Fewer girls than boys had physical defects.

Science News Letter, October 17, 1931

ZOOLOGY

Eagle Takes Bobcat for Aerial Ride and Drops Him

AN EAGLE that has proved its ability to "lick its weight in wildcats" is the boast of Mesa Verde National Park. And the dead wildcat is there to prove it.

Superintendent Marshall Finnan tells the story. A roadbuilding crew of Navajo Indians were startled to see a big eagle swoop down upon a full-grown bobcat, and carry its yowling, spitting prey high into the air. At a height of about 1,800 feet the eagle let go, and the cat crashed down upon the highway, dead.

The Indians rushed to retrieve the wildcat, and at the same time the eagle swooped again, making several attempts to regain possession of its prey. Another party of Indians on the road-way above the scene began to throw rocks at the bird to drive it away. This they succeeded in doing, but unfortunately one of the missiles struck another worker on the head hard enough to put him in the hospital for several days.

Now the mounted skin of the wildcat, with the scars of the eagle's talons plainly visible, stands on top of a case in the Park museum.

Science News Letter, October 17, 1931

PHYSIOLOGY

Effect of Environment On Growth Rate is Short

THE INFLUENCE of environment on the growth rates of children is effective for a short period only, it appears from a report of Dr. Leonard Findlay of the East London Hospital for Children at Shadwell to the Congress of the Royal Sanitary Institute at Glasgow.

Whatever the nature of the special factor or factors in environment which exert their influence for good or ill, they appear to be active only during a comparatively short period of the child's life, Dr. Findlay said.

He compared the growth of city and country children of the same social class. Between the ages of six and eighteen months, the city child grew more slowly than the country child, but after this age he grew more quickly than the country child. However, he never grew at a sufficient rate to make up for the delay during infancy.

Science News Letter, October 17, 1931

ASTRONOMY

Motion of the Fixed Stars

"A Classic of Science"

This Shift of Star Images, Known as Aberration of Light, Helps Astronomers Calculate Star Motions and Velocities

A LETTER from the Reverend Mr. James Bradley, Savilian Professor of Astronomy at Oxford, and F. R. S., to Dr. Edmond Halley, *Astronom. Reg. etc.*, giving an ACCOUNT OF A NEW DISCOVERED MOTION OF THE FIX'D STARS. In *Philosophical Transactions of the Royal Society, London, 1727.*

SIR:

You having been pleased to express your Satisfaction with what I had an Opportunity some time ago, of telling you in Conversation, concerning some Observations, that were making by our late worthy and ingenious Friend, the honorable Samuel Molyneux Esquire, and which have since been continued and repeated by myself, in order to determine the Parallax of the fix'd Stars; I shall now beg leave to lay before you a more particular Account of them.

Prompted by Curiosity

Mr. Molyneux's Apparatus was completed and fitted for observing about the End of November 1725, and on the third Day of December following, the bright Star at the Head of *Draco* (marked ν by *Bayer*) was for the first Time observed, as it passed near the Zenith, and its Situation carefully taken with the Instrument. The like Observations were made on the 5th, 11th and 12th Days of the same Month, and there appearing no material Difference in the Place of the Star, a farther Repetition of them at this Season seemed needless, it being a Part of the Year, wherein no sensible Alteration of Parallax in this Star could be expected. It was chiefly therefore Curiosity that tempted me (being then at *Kew*, where the Instrument was fixed) to prepare for observing the Star on December 17th, when having adjusted the Instrument as usual, I perceived that it passed a little more Southerly this Day than when it was observed before. Not suspecting any other Cause of this Ap-

pearance, we first concluded, that it was owing to the Uncertainty of the Observations, and that either this or the foregoing were not so exact as we had before supposed; for which Reason we purposed to repeat the Observation again, in order to determine from whence this Difference proceeded; and upon doing it on December 20th, I found that the Star passed still more Southerly than in the former Observations. This sensible Alteration the more surprized us, in that it was the contrary way from what it would have been, had it proceeded from an annual Parallax of the Star: But being now pretty well satisfied, that it could not be entirely owing to the want of Exactness in the Observations; and having no Notion of anything else, that could cause such an apparent Motion as this in the Star; we began to think that some Change in the Materials, &c., of the Instrument itself, might have occasioned it. Under these Apprehensions we remained some time, but being at length fully convinced, by several Trials, of the great Exactness of the Instrument, and finding by the gradual Increase of the Star's Distance from the Pole, that there must be some regular Cause that produced it; we took care to examine nicely, at the Time of each Observation, how much it was: and about the Beginning of March 1725, the Star was found to be 20" more Southerly than at the Time of the first Observation. It now indeed seemed to have arrived at its utmost Limit Southward, because in several Trials made about this Time, no sensible Difference was observed in its Situation. By the Middle of April, it appeared to be returning back again towards the North; and about the beginning of June, it passed at the same Distance from the Zenith as it had done in December when it was first observed.

From the quick Alteration of this Star's Declination about this Time (it increasing a Second in three Days) it was concluded, that it would now pro-

ceed Northward, as it before had done Southward of its present Situation; and it happened as was conjectured: for the Star continued to move Northward till September following, when it again became stationary, being then near 20" more Northerly than in June, and no less than 39" more Northerly than it was in March. From September the Star returned towards the South, till it arrived in December to the same Situation it was in at that time twelve Months, allowing for the Difference of Declination on account of the Precession of the Equinox.

Instrument Not Cause

This was a sufficient Proof, that the Instrument had not been the Cause of this apparent Motion of the Star, and to find one adequate to such an Effect seemed a Difficulty. A Nutation of the Earth's Axis was one of the first things that offered itself upon this Occasion, but it was soon found to be insufficient; for though it might have accounted for the change of Declination in ν *Draconis* yet it would not at the same time agree with the Phaenomena in other Stars; particularly in a small one almost opposite in right Ascension to ν *Draconis*, at about the same Distance from the North Pole of the Equator: For, though



JAMES BRADLEY

Who discovered aberration of Star images. He succeeded Halley as Astronomer Royal.

this Star seemed to move the same way, as a Nutation of the Earth's Axis would have made it, yet it changing its Declination but about half as much as *v Draconis* in the same time (as appeared upon comparing the Observations of both made upon the same Days, at different Seasons of the Year) this plainly proved, that the apparent Motion of the Stars was not occasioned by a real Nutation, since if that had been the Cause, the Alteration in both Stars would have been near equal. . . .

Discovers General Law

My instrument being fixed, I immediately began to observe such Stars as I judged most proper to give me light into the Cause of the Motion already mentioned. There was Variety enough of small ones; and not less than twelve, that I could observe through all the Seasons of the Year; they being bright enough to be seen in the Day-time, when nearest the Sun. I had not been long observing, before I perceived, that the Notion we had before entertained of the Stars being farthest North and South, when the Sun was about the Equinoxes, was only true of those that were near the solstitial Colure: And after I had continued my Observations a few Months, I discovered, what I then apprehended to be a general Law, observed by all the Stars, viz. That each of them became stationary, or was farthest North or South, when they passed over my Zenith at six of the Clock, either in the Morning or Evening. I perceived likewise, that whatever Situation the Stars were in with respect to the cardinal Points of the Ecliptick, the apparent motion of every one tended the same Way, when they passed my instrument about the same Hour of the Day or Night; for they all moved Southward, while they passed in the Day, and Northward in the Night; so that each was farthest North, when it came about Six of the Clock in the Evening, and farther South, when it came about Six in the Morning. . . .

When the Year was completed, I began to examine and compare my Observations, and having pretty well satisfied myself as to the general Laws of the Phaenomena, I then endeavoured to find out the Cause, of them. I was already convinced, that the apparent Motion of the Stars, was not owing to a Nutation of the Earth's Axis. The next Thing that offered itself, was an Alteration in the Direction of the Plumb-line, with which the Instrument

was constantly rectified; but this upon Trial proved insufficient. Then I considered what Refraction might do, but here also nothing satisfactory occurred. At last I conjectured, that all the Phaenomena hitherto mentioned, proceeded from the progressive Motion of Light and the Earth's annual Motion in its Orbit. For I perceived, that, if Light was propagated in Time, the apparent Place of a fixt Object would not be the same when the Eye is at Rest, as when it is moving in any other Direction, than that of the Line passing through the Eye and Object; and that, when the Eye is moving in different Directions, the apparent Place of the Object would be different.

I considered this Matter in the following Manner. I imagined CA to be a Ray of Light, falling perpendicularly upon the Line BD; then if the

Eye is at rest at A, the Object must appear in the Direction AC, whether Light be propagated in Time or in an Instant. But if the Eye is moving from B towards A, and Light is propagated in Time, with a Velocity that is to the Velocity of the Eye, as CA to BA; then Light moving from C to A, whilst the Eye moves from B to A, that Particle of it, by which the Object will be discerned, when the Eye in its Motion comes to A, is at C when the Eye is at B. Joining the Points B, C, I supposed the Line CB, to be a Tube (inclined to the Line BD in the Angle DBC) of such a Diameter, as to admit of but one Particle of Light; then it was easy to conceive, that the Particle of Light at C (by which the object must be seen when the Eye, as it moves along, arrives at A) would pass through the Tube BC, if it is inclined to BD in the Angle DBC, and accompanies the Eye in its Motion from B to A; and that it could not come to the Eye, placed behind such a Tube, if it had any other Inclination to the Line BD. If instead of supposing CB so small a Tube, we imagine it to be the Axis of a larger; then for the same Reason, the Particle of Light at C, could not pass through that Axis, unless it is inclined to BD, in the Angle CBD. In like manner, if the Eye moved the contrary way, from D towards A, with the same Velocity;



then the Tube must be inclined in the Angle BDC. Although therefore the true or real Place of an Object is perpendicular to the Line in which the Eye is moving, yet the visible Place will not be so, since that, no doubt, must be in the Direction of the Tube; but the Difference between the true and apparent Place will be (*ceteris paribus*) greater or less, according to the different Proportion between the Velocity of Light and that of the Eye. So that if we could suppose that Light was propagated in an instant, then there would be no Difference between the real and visible Place of an Object, although the Eye were in Motion, for in that case, AC being infinite with Respect to AB, the Angle ACB (the Difference between the true and visible Place) vanishes. But if Light be propagated in Time (which I presume will readily be allowed by most of the Philosophers of this Age) then it is evident from the foregoing Considerations, that there will be always a Difference between the real and visible Place of an Object, unless the Eye is moving either directly towards or from the Object. And in all Cases, the Sine of the Difference between the real and visible Place of the Object, will be to the Sine of the visible Inclination of the Object to the Line in which the Eye is moving as the Velocity of the Eye to the Velocity of Light.

Visibility Altered

If Light moved but 1000 times faster than the Eye, and an Object (supposed to be at an infinite Distance) was really placed perpendicularly over the Plain in which the Eye is moving, it follows from what hath been already said, that the apparent Place of such an Object will be always inclined to that Plain, in an Angle of $89^{\circ} 56' \frac{1}{2}$; so that it will constantly appear $3' \frac{1}{2}$ from its true Place, and seem so much less inclined to the Plain, that way towards which the Eye tends. That is, if AC is to AB (or AD) as 1000 to one, the Angle ABC will be $89^{\circ} 56' \frac{1}{2}$, and $ACB = 3' \frac{1}{2}$, and $BCD = 2ACB = 7'$. So that according to this Supposition, the visible or apparent Place of the Object will be altered $7'$, if the Direction of the Eye's Motion is at one time contrary to what it is at another.

If the Earth revolve round the Sun annually, and the Velocity of Light were to the Velocity of the Earth's Motion in its Orbit (which I will at present suppose to be a Circle) as 1000 to one; then tis easy to conceive, that a Star

"The Edison Effect"

the principle of the electron tube, is an example of the indirect influence of America's Greatest Inventor

THOMAS A. EDISON

Descriptions of the first studies of this phenomenon will be published as
THE NEXT CLASSIC OF SCIENCE

really placed in the very Pole of the Ecliptick, would, to an Eye carried along with the Earth, seem to change its Place continually, and (neglecting the small Difference on the Account of the Earth's diurnal Revolution on its Axis) would seem to describe a Circle round that Pole, every Way distant therefrom $3\frac{1}{2}$. So that its Longitude would be varied through all the Points of the Ecliptick every Year; but

EVOLUTION

Gibbon-Like Animal Declared Ancestor of Both Man and Ape

Human Evolution Can be Traced Back to this Creature Of Prehistoric Egypt, Scientist Tells British Meeting

PROPLIOPITHECUS is proclaimed the common ancestor of man and apes, acceptable to all students of human evolution as "the starting point from which to derive evolutionary history of man and ape," by Sir Arthur Keith, eminent British anthropologist and anatomist.

Propliopithecus was a primitive small form of gibbon which lived in Egypt at the beginning of the Oligocene period, some thirty-five million years ago. It is known from teeth and jaws discovered by Prof. Max Schlosser in 1910. This earliest gibbonish form, known to have been very similar to living gibbons, was then ortho-grade in posture, habitually walking on all fours; and although of small size was ancestor of the higher primates to whom erect posture is peculiar. Human lineage can be traced backward to this creature regardless whether, as Dr. W. K. Gregory and Prof. Elliot Smith believe, humans broke away from apes in Miocene times, or as Sir Arthur Keith believes, earlier in evolution, or as Dr. Henry

its Latitude would always remain the same. Its right Ascension would also change, and its Declination, according to the different Situation of the Sun in respect to the equinoctial Points; and its apparent Distance from the North Pole of the Equator would be 7' less at the Autumnal, than at the vernal Equinox.

The greatest Alteration of the Place of a Star in the Pole of the Ecliptick (or which in Effect amounts to the same, the Proportion between the Velocity of Light and the Earth's Motion in its Orbit) being known; it will not be difficult to find what would be the Difference upon this Account, the Difference between the true and apparent Place of any other Star at any time; and on the contrary, the Difference between the true and apparent Place being given; the Proportion between the Velocity of Light and the Earth's Motion in its Orbit may be found.

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Fairfield Osborn believes, still earlier.

"Paleontological evidence favors the theory formulated by Darwin in 1870, that man and anthropoid apes are descendants from a common stock," Sir Arthur said, discussing more recent fossil human remains. He believes that Rhodesian man, found in Africa, will prove to be an early form of Negro, although he is not positive.

"*Homo-rhodesiensis* is the only extinct type so far discovered whose crude features certainly foreshadow those of modern man," he said.

It is extremely probable that Heidelberg man was ancestral to Neanderthal man, though not in direct lineage to modern man. Sir Arthur considers *Pithecanthropus* of Java, *Sinanthropus* of China, *Eoanthropus* of Piltdown and *Palaeanthropus* of Heidelberg to be the four oldest fossil human remains, dating from the earliest Pleistocene or Ice Age. But they represent four separate genera of mankind, whereas living races are all one species.

Science News Letter, October 17, 1931

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INVENTION

Research Aided by Machine Solving Difficult Equations

**New Device, Consisting Entirely of Mechanical Parts,
Does Valuable "Thinking" for the Scientist and Engineer**

A NEW MACHINE which can solve the complex mathematical problems arising in the course of scientific research has been made by Prof. V. Bush at the Massachusetts Institute of Technology.

The "differential analyzer," as Prof. Bush calls his mechanical thinker, will do for the advanced branches of science and engineering what the adding machine has done for business accounting methods.

When a physicist or chemist makes a guess or forms a theory about a scientific problem, he can often express it in the form of what he calls a "differential equation." This is a collection of mathematical symbols which has a perfectly definite meaning, but yet the scientist cannot test it directly by experiment. The equation must first be "solved."

The result of this process is a solution or "integral" which, though also an equation, has the advantage that all the quantities occurring in it can be measured in the laboratory. The obtaining of the solution often requires a high degree of mathematical skill and much patience.

Prof. Bush's new machine promises to do this difficult and frequently occurring job.

Discussed Two Centuries Ago

The possibility of using machinery to solve scientific problems was discussed in detail two hundred years ago by the famous German mathematician Leibnitz, who invented the differential calculus. Leibnitz's idea was to relegate to the machine those parts of the process of thought which are inherently mechanical and repetitive. But though he was a great genius and inventor he did not have the accurate machine tools, new alloys, thermionic tubes and photoelectric cells now available to the modern engineer.

The present status of physics and engineering is peculiarly favorable to a development such as Leibnitz imagined. The department of electrical engineering of the Massachusetts Institute of

Technology has devoted itself to this problem.

The new differential analyzer has already been used to solve problems of electric transmission and has been tested for precision. It consists entirely of mechanical parts. The main problems encountered in its construction have been those of backlash.

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Setting the World To Streamlines

From Page 247

It can be seen that the matter of streamlining is making many of the automotive world's engineers sit up and think, if they haven't done so already. Streamlining has a wide application, but the idea seems most revolutionary where it concerns the ordinary automobile.

It is hard to realize that if our automobile were properly shaped, it would give us, even at medium speeds, twice as many miles on a gallon of gas. If such a thing is possible, why has it not been put into use years ago?

The answer seems to be that only with the introduction of aircraft have there been possible speeds high enough to justify a consideration of air resistance. Furthermore, it is probable that most automobile manufacturers have been slow to take streamlining seriously because they felt that such odd designs in car bodies would not be popular with the motoring public. At any rate, it is evident that automobile styles have kept the same general outline for almost twenty years.

Extensive streamlining, some authorities say, is not practical at present because long streamlined bodies would waste space within the automobile and make the parking problem even more acute. In contrast, a leading engineer predicts rear-engined streamlined cars for America within the next few years and points to the success Germany has already had with streamlining.

Science News Letter, October 17, 1931

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ARCHAEOLOGY

Discoveries Tell of Life in Arctic Thousand Years Ago

Goggles and Knife Handles of Wood, Human Hair, All Perfectly Preserved, Dug up at Oldest Eskimo Settlement

NEW EVIDENCE of what life was like in the Far North a thousand years and more ago has been dug out of Alaskan soil by Moreau B. Chambers, young archaeologist, excavating for the Smithsonian Institution. Mr. Chambers has just returned to Washington, following a summer spent at the oldest known Eskimo settlements in America, on St. Lawrence Island.

The Arctic ice box, as the frozen soil of this region has been called, has proved more strikingly than ever its efficiency at preserving household goods and trappings of ancient Eskimo life. Out of the mound that represents a very old village, Mr. Chambers dug such things as knives, completely preserved. Handles of wood are still bound to stone blades by baleen thongs. The blades might be expected to have survived so long. To find wood so perfectly kept is an archaeological wonder.

A little brush is another relic of rare interest. The handle is a stick of wood. To this is tied a bunch of short hair—human hair.

Finger Rests

Ingenuity of Eskimo craftwork in the ancient times is shown by a knife such as women used for cutting meat and cutting out garments. These knives were the Eskimo woman's scissors. They were shaped like a modern butcher's mincing knife, and the blade of stone fitted in a slot at the base of the long handle. The unusual feature of the knife found by Mr. Chambers is that the handle has a scooped-out hole on top, where the index finger would fit comfortably. On the side of the handle are several depressions made for the fingers. A modern Eskimo who happened to be nearby when the knife was displayed said this must be a "little girl's knife" especially made so that some young Eskimo would not cut herself. The carving on the ivory handle was admirably designed to follow the contours of the finger rests.

Mr. Chambers also unearthed wooden

goggles which look like masks and which were used by the Eskimos to protect their eyes from the glare on the snow. In addition there are numerous harpoon heads of fossil ivory and any number of articles which are puzzles to archaeologists and to modern Eskimos alike. With the new expedition's discoveries, the Smithsonian Institution now has the finest collection of ancient Eskimo material in existence.

The new articles fill out the story of what happened in the Far North in prehistoric times, it was explained by

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912
OF SCIENCE NEWS LETTER published weekly at Baltimore, Md., for October 1, 1931.
Washington
District of Columbia } ss.

Before me, a Notary Public in and for the District of Columbia aforesaid, personally appeared Watson Davis, who, having been duly sworn according to the law, deposes and says that he is the Editor of the SCIENCE NEWS LETTER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

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Watson Davis,
Editor.

Sworn to and subscribed before me this 9th day of October, 1931.
[SEAL]

Charles L. Wade.
(My commission expires April 6, 1933.)

Henry B. Collins, Jr., of the Smithsonian, who has made several expeditions to the same territory and who discovered the villages where Mr. Chambers has been excavating.

Another young archaeologist, James A. Ford, who accompanied Mr. Chambers on his northern expedition, is remaining at Point Barrow, Alaska, through the winter, so as to be able to spend the full season next summer in excavations. Ordinarily, so much time is spent in reaching northern points after the ice breaks up, that the digging season is brief. Mr. Ford expects to excavate at Point Barrow, which is one of the key points of ancient Eskimo culture.

Science News Letter, October 17, 1931

In prehistoric times, Polynesian natives made bamboo sailing charts and sailed their canoes over long distances at sea.

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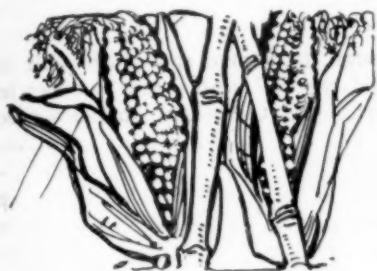
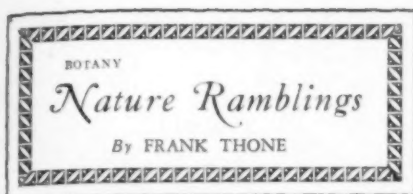
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A Botanical Orphan

WHEN the first Spanish explorers made contact with the natives of the New World, they found them cultivating and using a very peculiar kind of grain, to which the white men gave the name "Indian corn." In one of the Indian languages it was known as "mahiz," and this name has survived as its proper title: maize.

To be sure, most of the farmers who grow it don't call it that, and would hardly know what you were talking about if you referred to their principal crop by its historically correct name. To them it is known simply as "corn." The grains called, collectively, "corn" in England, and by the equivalent "Korn" in German, are the "small grains" of American agricultural parlance.

But although it is of tremendous importance in both the Americas, and has spread afar into lands like South Africa and India and the Black Sea Basin, its origin is still a riddle. The American Indians had it all over the continent, wherever it could be grown, when the white men came. There seems to be some evidence that it originally came from the South American uplands, though that is not a certainty. But the wild ancestor-plant was never found.

The nearest thing to it that botanists have ever been able to discover is a tropical American grass, found both wild and in cultivation. The Aztecs grew it and called it "teosinte," which means "grain of the gods"; but it does not look much like maize.

A number of botanists and plant breeders have attempted to induce teosinte to evolve into maize. But none of them has ever been successful; so that America's chief grain remains a botanical orphan.

Science News Letter, October 17, 1931

ETHNOLOGY

Ultra-Modern Marriage Laws Governed Ancient Egyptians

THE MOST RADICAL ideas of marriage reform tried or proposed in the world today are "as old as the Egyptians," it appears from a study of Egyptian marriage law made by W. F. Edgerton and just published by the Oriental Institute of the University of Chicago.

Mr. Edgerton has examined closely references to marriage in Egyptian documents, especially those of the Ptolemaic period, during the centuries just preceding the Christian era.

An Egyptian marriage continued during mutual consent; either party could dissolve it at will, declares Mr. Edgerton. More remarkable than this was an arrangement whereby marriage could be limited in advance to a definite period.

Arranged by Private Contract

The Egyptologist concludes that neither church nor state took a hand in marriages. Neither the bride nor the groom was required to put hand or seal to any written document. The affair was arranged by private contract. To make a legal marriage it was sufficient for the couple to regard themselves as man and wife or to allow it to be known publicly that they so regarded themselves.

"Sitting together at the wedding feast would naturally be an implicit pub-

lic acknowledgment of the fact," explains Mr. Edgerton. "We have no reason to suppose that any other ceremony whatever was required."

Mr. Edgerton adds, however, that possibly the consent of the couple's parents may have been required.

Science News Letter, October 17, 1931

ZOOLOGY

Turtle by the Ton Taken From Lake in Missouri

TURTLE by the ton is being handled by the Missouri Game and Fish Department in its project to eradicate undesirable fish and other aquatic animals from Lake Taneycomo.

In the short space of two months more than 4,000 turtles, aggregating nearly eight tons in weight, were removed with nets from the lake, and at the same time a few bass, bluegill, carp, and catfish were taken. All the game fish were returned to the lake, while some of the carp supplied fresh food for needy families in the community.

Turtles of the marketable variety were shipped to Philadelphia. The non-marketable bait-stealers were killed and buried.

The eradication work will continue through the fall months.

Science News Letter, October 17, 1931

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Industrial Science

SCIENCE IN ACTION—Edward R. Weidlein and William A. Hamor—*McGraw-Hill*, 310 p., \$3. This book is especially timely, coming as it does at a time when industry can no longer "get by" with easy-going boom-time methods and dependence on research done by scientists in outside (frequently foreign) laboratories, but must, if it is to recover normal health, develop new efficiencies and new economies based on science. Every industrialist, large or small, and every banker to whom industrialists owe money, ought to be giving this volume a most prayerful reading right now.

Science News Letter, October 17, 1931

Geology

REPORT OF THE COMMITTEE ON SEDIMENTATION, 1929-1930—*National Research Council*, 97 p., \$1. Anyone who has ever seen a section of a mountain of Cambrian age or younger, or who has ever watched a harbor dredge struggling with the undesired gifts of a too-generous river god needs no argument to be convinced of the great scientific and practical importance of the process of sedimentation. For this reason the present report of the National Research Council's special committee on the subject will receive much interested attention.

Science News Letter, October 17, 1931

Health Education

MASTODONS, MICROBES AND MAN—W. W. Peter—*Cleanliness Institute*, 27 p., review copies free to health workers and school administrators; others 15c, special rates for large quantities. Man's ancestors fought their enemies, the mastodons, with one type of weapon, but present-day man must fight his enemies, the microbes, with quite another. This booklet aims to show the importance of biological cleanliness in preventing the spread of disease.

Science News Letter, October 17, 1931

Pseudanthropology

THE ADVENTURE OF MANKIND—Eugen Georg, translated by Robert Bek-Gran—*Dutton*, 325 p., \$5. The author's theories include such astonishing views as that "man has enjoyed a past of millions of years," that human beings clashed with the great saurians of the Mesozoic era, that Atlantis and other lost continents existed, and that strange bipeds such as goblins lived in those days, "according to countless re-

ports." After launching these bombshells against orthodox science in his introduction, the author proceeds to a discussion of political science, world civilization, and archaeological remains, leading up to an argument that culture had one center of origin—Atlantis. The book closes on the note of "The evolutionistic expression of the dualism of the world."

Science News Letter, October 17, 1931

Horticulture

THE GARDEN CLUB MANUAL—Edith R. Fisher—*Macmillan*, 123 p., \$2. One of the potent factors that is making America a pleasanter place to live in is the rise of the garden club idea, which takes advantage of those twin opposites in human nature: co-operation and emulation. This book will help get clubs started.

Science News Letter, October 17, 1931

Psychology

GENIUS AND CREATIVE INTELLIGENCE—N. D. M. Hirsch—*Sci-Art*, 339 p., \$4.50. The report of a study begun when the author was a fellow of the National Research Council. The book is evidently written with the idea of encouraging action in the direction of raising the level of human intelligence. Dr. Hirsch urges what he terms "creative adaptation" i.e., increasing the reproduction of the socially fit while limiting that of the unfit as a remedy of varied social ills, including war, personal ugliness, and jazz.

Science News Letter, October 17, 1931

Public Health—Social Service

ANNUAL REPORT, 1930—*Milbank Memorial Fund*, 83 p. Describes the work in health education, health administration, research and social welfare carried on by the Milbank Memorial Fund during its twenty-fifth year. Grants for social welfare and relief were the largest ever made during any one year.

Science News Letter, October 17, 1931

Poetry

SCIENTIFIC THOUGHT IN POETRY—Ralph B. Crum—*Columbia University Press*, 246 p., \$3. Science and poetry are not mutually exclusive activities of the mind of man; several great poets have been competent scientific thinkers. This book considers, among others, Lucretius, Erasmus Darwin, Goethe and Tennyson.

Science News Letter, October 17, 1931

Biography

A TRIBUTE TO MICHAEL FARADAY—Rollo Appleyard—*R. R. Smith*, 204 p., \$2.50. A most timely biography to the great English physicist whose centenary has just been celebrated in London, by an appreciative author with a good sense of selection for the highlights of a great man's life and for pertinent passages in his correspondence. This book is sure to be wanted especially by all who have students who are just embarking on their ventures into the now vastly enlarged world of adventure in physics.

Science News Letter, October 17, 1931

Chemistry

SIXTH REPORT OF THE COMMITTEE ON CONTACT CATALYSIS—Robert E. Burk—*National Research Council*, 47 p., 50c. Catalytic reactions are not only of interest to the academic chemist; they are among the most important processes in modern chemical industry. This report of a National Research Council committee sums up recent advances.

Science News Letter, October 17, 1931

Psychology

SPEECH PATHOLOGY—Lee Edward Travis—*Appleton*, 331 p., \$4. A textbook giving the causes, diagnosis and treatment of speech disorders of all kinds. The part on stuttering is based largely on the author's own research and contains much original material. The entire subject is considered on a neurophysiological basis. Of special interest to psychologists and teachers.

Science News Letter, October 17, 1931

Anthropology

IN QUEST OF GLACIAL MAN—Madison Bentley—*National Research Council*, 20 p., 40c. A compilation of opinions and suggestions for procedure, by a number of leading American anthropologists, archaeologists and geologists, in the search for and evaluation of possible remains of very early man in the Western Hemisphere.

Science News Letter, October 17, 1931

Psychology

DREAMS AND PERSONALITY—Frederick Pierce—*Appleton*, 337 p., \$3. The author compares the dreams of many varied personalities with their waking, conscious selves, and compares his own conclusions with those of Freud.

Science News Letter, October 17, 1931